TARGET AUDIENCE: All CE Personnel

AFCESA

A-GRAM

AIR FORCE CIVIL ENGINEER SUPPORT AGENCY

99-04 **JANUARY 1999**

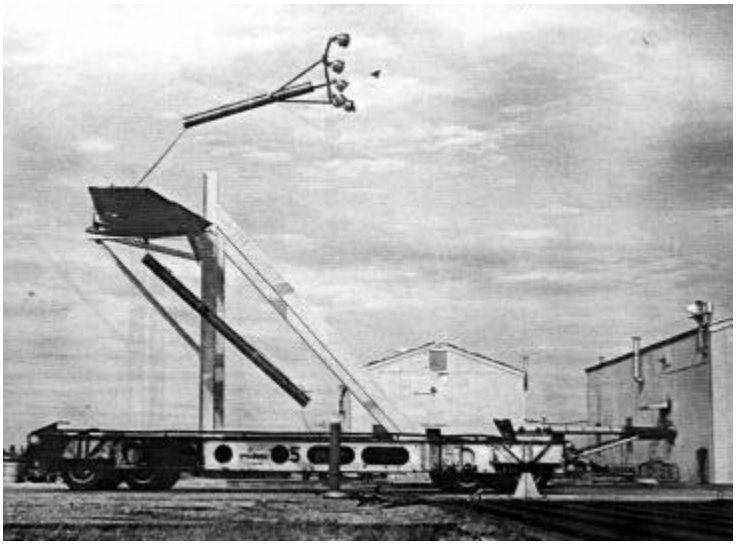
FRANGIBLE NAVAID SUPPORTS

SYNOPSIS:

Air Force Manual 32-1013 V2, *Planning Criteria and Waivers for Airfield Support Facilities*, requires all above ground structures sited within the protected areas of the airfield be, to the extent practical, of frangible or low impact resistance construction. These structures also must support wind and ice loads, yet be designed to cause minimal damage to aircraft. This enhances the safety of airfield operations. The requirement is a challenge for the designer, and can not be met in all cases. Remember the caveat, "to the extent practical." One example of an exception to this requirement is aircraft arresting systems. The hazards posed by these systems are mitigated by siting the systems as far from the runway as possible. Sensitive electronic components such as the Instrument Land-ing System (ILS) Farfield Monitor pose another challenge. The antenna weighs approximately 75 pounds, and is mounted at the departure end of the runway to allow line-of-sight to the Localizer Array at the approach end of the runway. Installation of this or any other piece of equipment should sustain a life cycle equivalent to that of the system without imposing undue maintenance requirements. Because of these needs, Farfield Monitors have typically been mounted on utility poles. No studies have been accomplished to identify a suitable alternative.

ADAPTATION OF OTHER SYSTEM DESIGNS:

The frangibility requirement also applies to airfield approach lights, for which studies and testing have been conducted. In 1977, the Federal Aviation Administration (FAA) began a series of tests on various structures designed to support airfield approach lights. Their goal was to develop a support structure that would provide a 20-year life cycle, and if struck by an aircraft, minimize damage to the extent that the pilot could maintain control. Various materials and designs were tested at the Naval Air Warfare Center, Lakehurst NJ, using instrumented deadloads to impact the structures at approximately 75 knots. The tests resulted in publication of FAA E-2702, *Specification for Low-Impact Resistant Structures*. This specification, along with the associated drawings, provides guidance for construction of tubular fiberglass supports, constructed in short sections, then bonded together using an integral helix ring at the joints. These structures break cleanly at the joints, minimizing collateral damage. They can also be adapted to accommodate a variety of equipment items. The critical element is in specifying the equipment mounting configuration.



COMMERCIAL SOURCE:

Contact Jaquith Industries, 600 East Brighton Avenue, Syracuse NY 13205. Telephone (315) 473-5700. Specify height, from three to 40-feet, in one inch increments. Also be sure to specify the type and model of equipment to be mounted.

CONTACT:

Mr. Mike Ates
HQ AFCESA/CESC
139 Barnes Drive, Suite 1
Tyndall AFB FL 32403-5319
DSN 523-6361
Comm: 850-283-6361
Email: atesm@afcesa.af.mil